

I CLAIM:

1. A semiconductor diode comprising:
 - a semiconductor die including a substrate, a first semiconductor film formed on said substrate,
 - 5 a second semiconductor film formed on said first semiconductor film, a first metal contact formed on said first semiconductor film, and a second metal contact formed on said second semiconductor film, one of said first and second semiconductor films being
 - 10 made of an n-type semiconductor material, the other one of said first and second semiconductor films being made of a p-type semiconductor material, said semiconductor die having two opposing first side edges and two opposing second side edges which
 - 15 cooperates with said first side edges to define thereamong two diagonally opposite first corners and two diagonally opposite second corners, said first semiconductor film having an exposed area that is exposed from said second semiconductor film adjacent
 - 20 to one of said first side edges and that extends between one of said first corners and one of said second corners, said first metal contact having a first strip portion that is formed on said exposed area, and a first bonding portion that extends from
 - 25 and that has a width greater than that of said first strip portion and a length less than that of said first strip portion, said second metal contact having a

second strip portion that is disposed adjacent to the other one of said first side edges and that extends between the other one of said first corners and the other one of said second corners, and a second bonding portion that extends from and that has a width greater than that of said second strip portion and a length less than that of said second strip portion.

2. The semiconductor diode of Claim 1, wherein said first bonding portion is formed on said one of said 10 first corners, said first strip portion extending from said first bonding portion to said one of said second corners, said second bonding portion being formed on the other one of said first corners, said second strip portion extending from said second bonding portion to the other one of said second corners.

3. The semiconductor diode of Claim 1, further comprising a quantum well sandwiched between said first and second semiconductor films.

20 4. The semiconductor diode of Claim 1, further comprising an ohmic metal contacting film sandwiched between said second semiconductor film and said second metal contact.

25 5. The semiconductor diode of Claim 4, further comprising a dielectric film sandwiched between said second metal contact and said metal contacting film, said dielectric film having a geometric dimension

less than that of said second metal contact such that said second metal contact is in electrical contact with said metal contacting film.

6. The semiconductor diode of Claim 1, wherein said 5 substrate is made of a material selected from a group consisting of sapphire and silicon carbide.

7. The semiconductor diode of Claim 1, wherein said n-type semiconductor material is n-doped GaN material, and said p-type semiconductor material is p-doped GaN 10 material.

8. A method for manufacturing semiconductor diodes, comprising the steps of:

preparing a substrate;

15 forming a first semiconductor film on said substrate;

forming a second semiconductor film on said first semiconductor film, wherein one of said first and second semiconductor films is made of an n-type semiconductor material, and the other one of said 20 first and second semiconductor films is made of a p-type semiconductor material;

selectively masking and etching said second semiconductor film to define a plurality of orderly arranged exposed areas on said first semiconductor 25 film which are exposed from said second semiconductor film;

forming a plurality of orderly arranged first

metal contacts on said exposed areas of said first semiconductor film, respectively, and a plurality of second metal contacts on said second semiconductor film, each of said second metal contacts being 5 associated with a respective one of said first metal contacts; and

dicing assembly of said substrate, said first semiconductor film, said second semiconductor film, said first metal contacts, and said second metal 10 contacts to form a plurality of semiconductor dies, each of which has two opposing first side edges and two opposing second side edges which cooperates with said first side edges to define thereamong two diagonally opposite first corners and two diagonally 15 opposite second corners;

wherein, said exposed area on said first semiconductor film of each of said semiconductor dies is disposed adjacent to one of said first side edges and extends between one of said first corners and one 20 of said second corners, said first metal contact of each of said semiconductor dies having a first strip portion that is formed on said exposed area, and a first bonding portion that extends from and that has a width greater than that of said first strip portion 25 and a length less than that of said first strip portion, said second metal contact of each of said semiconductor dies being disposed adjacent to the

other one of said first side edges and having a second strip portion that extends between the other one of said first corners and the other one of said second corners, and a second bonding portion that extends 5 from and that has a width greater than that of said second strip portion and a length less than that of said second strip portion.

9. The method of Claim 8, wherein said first bonding portion is formed on said one of said first corners, 10 said first strip portion extending from said first bonding portion to said one of said second corners, said second bonding portion being formed on the other one of said first corners, said second strip portion extending from said second bonding portion to the 15 other one of said second corners.

10. The method of Claim 8, further comprising a step of forming a quantum well on said first semiconductor film prior to the formation of said second semiconductor film on said first semiconductor film.

20 11. The method of Claim 8, further comprising a step of forming an ohmic metal contacting film on said second semiconductor film prior to the formation of said second metal contact on said second semiconductor film.

25 12. The method of Claim 11, further comprising a step of forming a dielectric film on said metal contacting film, said second metal contact being formed on said

dielectric film which has a geometric dimension less than that of said second metal contact such that said second metal contact is in electrical contact with said metal contacting film.

5 13. The method of Claim 8, wherein said substrate is made of a material selected from a group consisting of sapphire and silicon carbide.

14. The method of Claim 8, wherein said n-type semiconductor material is n-doped GaN material, and

10 said p-type semiconductor material is p-doped GaN material.